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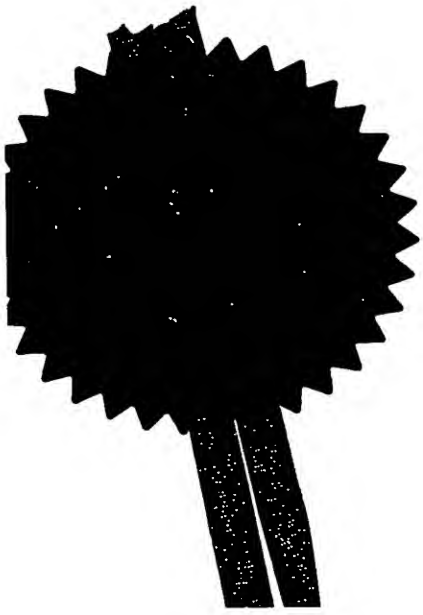

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1. Your reference — PRW/P201244

2. 0216513.2 — 17 JUL 2002

3. Full name, address and postcode of the applicant *(underline all surnames)*

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Patents ADP number *(if you know it)* 8426835001

If the applicant is a corporate body, give the country/state of its incorporation — a EIRE

4. Title of the invention — POST MOUNTING ARRANGEMENT

5. Name of your agent *(if you have one)*

URQUHART-DYKES & LORD

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

Tower House
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Patents ADP number *(if you know it)* **1644004**

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Country	Priority application number *(if you know it)*	Date of filing *(day/month/year)*

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Signature Urquhart-Dykes & Lord Date

URQUHART DYKES & LORD 17 July 2002

12. Name and daytime telephone number of person to contact in the United Kingdom **P R WHARTON – 0113 245 2388**

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POST MOUNTING ARRANGEMENT

The present invention relates to a post mounting arrangement for, in particular, mounting and erecting items of street furniture for example pedestrian guard rails, street signs or other items of street furniture. Specifically the present invention relates to a socket arrangement for mounting and securing a post into the ground.

Throughout the road network and in our towns and cities there are a variety of situations where signs and barriers which for their support rely on the use of poles fixed into the ground. This type of structure, by the very nature of its location, is very vulnerable to impact from vehicular traffic and where poles enter the ground they are highly susceptible to corrosion.

When an impact or severe corrosion occurs, the resultant damage normally necessitates the need to remove the pole, or series of poles, and replace with new. As most poles are fixed into the ground in concrete, their replacement is time consuming, often involving shutting down sections of road or pavement with the associated inconvenience and the total cost is very expensive. Firstly, this invention seeks to provide a pole housing that can withstand the destructive impact to a pole without sustaining damage and which will then permit rapid replacement of the damaged pole. Hence significantly reducing the cost, time and inconvenience caused by the construction work incurred in their replacement.

In any situation where there is an impact, the more energy that can be absorbed within the structure without reaching the failure load of the components, then the less will be the damage to the structures involved. In situations where the poles form part of a crash barrier or guard rail system, it becomes a significant advantage if within the system there are provided specific components which absorb impact energy.

The conventional method and arrangement for installing a post is to dig a suitably sized hole at the installation site. The base of the post is placed into this hole and the remainder of the hole surrounding the post is filled in with concrete. The concrete sets and the post is thereby rigidly and permanently retained in the ground.

A problem with this arrangement is that the post is permanently fixed into the ground. Should the post become damaged (for example by being hit by a vehicle, etc.) and need to be replaced, the concrete needs to be broken up and removed. A new post then needs to be fitted and fresh concrete poured into the hole and allowed to set to fix the new post. This can take a considerable amount of time and can be difficult.

Alternative arrangements have been proposed, and are described in WO 92/20889 and WO 96/02704. In these arrangement a separate socket, comprising a tubular sleeve, is installed into the ground. The base of the post is then installed into the sleeve. A retaining portion, for example a resilient collar, of the sleeve releasably secures the post within the sleeve and so to the ground by virtue of an interference fit and frictional engagement of the post and sleeve. The sleeve is typically made from a plastics material such that it is resistance to corrosion. In order to strengthen the sleeve, in particular at the upper end where in use the bending stresses are at their greatest the sleeve may include a strengthening ring embedded and formed into the sleeve.

With such an arrangement the post can be more easily replaced in the event of damage by extracting the post from the socket/sleeve, and inserting a new post into the socket sleeve, without the need to dig up the ground surrounding the installation site. A problem with such an arrangement however is that the post can also be undesirably removed for example by vandals extracting the post from the socket. Whilst increasing the interference fit between the socket and post can make removal by vandals more difficult it will also inherently with this arrangement make removal, and installation of the post within the socket by authorised users replacing the post, more difficult.

Also in some cases when the post, or street furniture, is damaged for example following impact by a vehicle, the socket and in particular the embedded strengthening ring can be damaged. In such a case if the strengthening ring is damaged the socket needs to be removed and replaced by digging up the ground and breaking up the concrete within which the sleeve is affixed in a similar manner to that with conventional direct fixing and concreting in of the post. This obviates the advantages of the sleeve/socket arrangement.

The manufacture of an embedded strengthening ring within the moulded plastic sleeve/socket is also difficult and problematic. This undesirably increases costs.

It is therefore desirable to provide an improved post mounting arrangement for ground installation of a post which addresses the above described problems and/or which offers improvements generally. The invention seeks to provide a pole housing which is capable of absorbing impact energy, the amount of which can be tailored to some extent to match the specific application of the housing.

According to the present invention there is provided a post mounting arrangement and method of erecting a post as described in the accompanying claims.

In an embodiment of the invention there is provided a post mounting arrangement for ground installation of a post comprising a tubular body portion which is adapted to be installed into the ground and has an open end adapted to receive a post to be supported. The open end of the tubular body portion comprises an enlarged flange portion defining a head portion of the tubular main body portion. The head flange portion includes a resilient retaining collar adapted to receive and engage the post, and a strengthening band. The head portion comprises a first recess defined therein within which the said collar is engaged and mounted, and a second recess defined in the head portion outwardly of said first recess and adapted to receive the said strengthening band. The head portion further comprises a separate cap which is adapted to be fitted to and engages with said head portion to enclose said recesses and secure said collar and strengthening ring within said recesses.

With such an arrangement, and the securing of the collar by the separate cap, the collar can be arranged to more securely grip the post to prevent unauthorised removal of the post whilst the post can be easily removed, when required by removal of the cap to release the collar. Furthermore by locating the collar and strengthening band in the said recesses and then securing them in place using a separate cap, the strengthening band and collar of the assembly can be disassembled and the strengthening band and collar individually replaced in the event of damage without having to remove the entire socket from the ground. The

use of a separate cap, collar and in particular strengthening band located in the socket and secured in the socket by the cap, is also easier (and cheaper) to fabricate than some of the prior proposals in which these components are integrally fabricated and/or embedded within the socket assembly.

The post and tubular main body portion may be of a generally circular, square or other cross section.

The cap when engaged and fitted to the head portion is preferably adapted to urge the collar inwards, in use, into engagement with the post. Furthermore said first recess defined in said head portion is preferably adapted such that said collar can flex away from, in use, engagement with said post. The cap accordingly includes a portion which is adapted, when said cap is fitted to said head portion, cooperates with said first recess to urge said collar, in use, into engagement with said post. The cap in particular may include a flange projection which cooperates with said first recess and head portion to when the cap is fitted and in use urge the collar into engagement with said post.

Such an arrangement provides for a more secure gripping and securing of the post within the tubular main body and socket.

Preferably the collar comprises a post abutment surface which is adapted to provide, in use, an enhanced interference fit and grip on the said post against movement in a first direction as compared to movement in a second direction. The post abutment surface of said collar may comprises at least one serration or ridge. The at least one serration is preferably directionally orientated such that a first surface of said serration abuts said post and a different angle to a second surface of said serration.

Such an arrangement for the abutment surface of the collar allows the post to be more easily inserted into the collar than be removed from the collar.

The collar is preferably fabricated from a resilient material, for example a rubber material. The tubular body portion is preferably fabricated from an injection moulded plastic material, for example nylon.

The cap is preferably adapted to be snap fitted to said head portion. In particular the cap may include a flange lip which is cooperatively engaged with a cooperating flange lip on said head portion.

In an embodiment of the invention there is also provided a method of erecting a post using a post mounting arrangement described above. The method comprising the steps of:

i. installing said tubular main body in the ground,
ii. installing said strengthening band in said second recess,
iii. installing said collar in said first recess,
iv. inserting a base end of said post through said collar and into said tubular body portion,
v. fitting said cap to said head portion to secure said collar within said head portion.

In this method the post may be inserted through said collar prior to installing said collar and inserting said post into said main tubular body.

The present invention will now be described by way of example only with reference to the following figures in which:

Figure 1 is a cross sectional view through the post mounting arrangement and socket in accordance with an embodiment of the present invention;

Figure 2 is a more detailed cross sectional view of the head portion of the socket shown in figure 1;

Figure 3 is a cross-sectional view of the tubular main body;

Figure 4 is a similar view to Figure 1 of another embodiment;

Figure 5 is a plan view of a compliant shock absorber; and

Figure 6 a cross sectional view on line x-x of Figure 5.

Referring to figures 1 and 2, there is shown a post mounting arrangement for mounting and securing a post 2 within the ground 1. The post 2 is associated with an item of street furniture, for example a traffic sign post, pedestrian guard rail leg post or mounting post for some other form of street furniture. It will be appreciated that there is a wide range of street furniture which is secured to the ground by way of one or more such mounting posts 2. Where a number of posts are to be secured, for example to mount a pedestrian guard rail fence, a series of such mounting arrangements can be disposed in the ground and along the street in order to secure a series of posts.

The post mounting arrangement comprises a post mounting socket assembly 4 which in use is installed within the ground 1 with a head portion 14 of the socket 4 generally flush with the ground level and the remainder of the socket 4 buried into the ground 1. A base end of a post 2 is fitted and secured into this socket 4 thereby securing and mounting the post 2 in the ground 1.

The socket assembly 4 comprises a main generally tubular main body portion 6. The tubular main body 6 defines an internal bore which corresponds to, although is slightly larger than, the outside diameter of the post 2 such that the post 2, in use can be easily inserted into the inner bore of the main body 6. In this embodiment the main body portion 6 is generally cylindrical and the post 2 is similarly of a cylindrical shape. It will be appreciated though that the main body 6 and post 2 could have other cross sectional shapes, for example square or rectangular in other embodiments.

Projecting from the outside of the main body portion 6 and spaced circumferentially around the outer circumference are a number of longitudinal ribs 5. Longitudinally spaced along the main body 6 there are also further circumferential ribs 16 which similarly project

from the outside of the main tubular body 6. These ribs 5,16 strengthen the main tubular body 6. Also, when installed into the ground 1, the ribs 5,16 are held and engaged in the surrounding ground material surrounding the outside of the socket 4. This ensures that the mounting socket 4, when installed into the ground 1, is securely affixed into the ground 1 and restrained from twisting and/or being withdrawn vertically from the ground 1.

One end, the in use lower end, of the tubular main body 6 is closed off in order to prevent the ingress of ground material into the inside of the tubular main body 6 and also to provide an end stop for the base end of the post 2 when installed within the tubular main body 6. The closed end of the main tubular body 6 comprises an upright stud projection 18 which projects longitudinally into the bore of the tubular main body 6. This stud projection 18 is concentric with the bore of the main tubular body 6 and is spaced radially from the inside of the bore. The side wall of the stud 18 is sloped and tapered inwardly with respect to the bore as the stud 18 projects into the bore. The base end of the post 2 is generally hollow and in use when the post 2 is fitted into the socket 4 the stud 18 engages the inside of the hollow base end of the tubular post 2. The tapering of the side wall of the stud 18 is configured such that there is a progressive interference fit and frictional engagement between the stud and post as the post is inserted vertically into the socket and onto the stud 18. The engagement of the stud with the post 2 locates and, in part secures the post 2 by friction into the socket 4.

The other open end of the tubular main body 6 and socket 4 comprises an enlarged head portion 14 in the form of an enlarged flange 15 projecting from and concentric with the main tubular body portion 6 and having an outer diameter greater than that of the main tubular body portion 6. This enlarged head portion 14 is shown in greater detail in figure 2.

Defined within the head portion 14 there is a first annular recess 22 concentric with the bore of the main tubular body 6. This recess 22 opens out inwardly onto the bore and in effect comprises a larger diameter bore portion of the bore of the main tubular body 6, and channel/groove, within the flange 14. An annular collar 12 is fitted and located within this first recess 22.

The annular collar 12 is fabricated from a resilient material, for example a rubber material such as for example EPDM (Ethylene Propylene Diene Monomer) a synthetic rubber. The inner diameter of the collar 12 is such that an inner surface of the collar tightly abuts against the outer surface of the installed post 2 such that there is a tight interference fit between the collar 12 and post 2. The annular collar 12, which itself is secured within the socket 4, grips and engages the outside of the post 2 thereby retaining and securing the post 2 within the socket 4. The inner surface 30 of the collar 12 includes a series of longitudinally spaced serrated circumferential ridges or teeth 31a,31b,31c which project inwardly. The serrations 31a,31b,31c are arranged and profiled such that they and the collar 12 provide greater resistance to longitudinal movement of the post 2 out of the socket 4 (i.e. upward) than to movement of the post 2 into the socket (i.e. downward). As shown, for example, in figure 2 the serrations 31a,31b,31c have a triangular cross section and are arranged in a fir tree type arrangement in which an upper part of each serration 31a,31b,31c is at a shallower tapering angle to the post 2 outer surface as compared to a lower portion of the each serration 31a,31b,31c. In this way the post 2 can be more easily installed into the socket 4 whilst removal of the post 2 from the socket 4, for example by a vandal, is made more difficult. In effect the collar 12 with the serrations 31a,31b,31c provides a one way directional grip and enhanced interference fit upon the post 2. It will be appreciated though that other profiling of the collar 12 instead of the serrations 31a,31b,31c illustrated could be used to provide this function in other embodiments.

Outwardly of the first recess 22 a second annular recess 20, in the form of a channel/groove formed in the end surface of the head portion 14, is defined within the head portion 14. The second recess 20 is similarly concentric with the bore of the main tubular body 6, and the first recess 22. This second recess 20 is radially separated from the first recess by a dividing wall portion 21 of the flange head portion 14. A strengthening band 8 in the form of an annular ring is located and fitted into the second recess 20. This strengthening or reinforcing band 8 is typically made from a material which is stronger than that of the remainder of the socket 4. For example whilst the socket 4 could be fabricated from an injection moulded plastic material for example a thermoplastic such a polypropylene, the strengthening band 8 could comprise 40% glass fibre reinforced compression moulded nylon material could be used for the strengthening band 8. The strengthening band 8 by

virtue of its greater strength and also due to its continuous circumferential configuration, strengthens the upper region of the socket 4.

Upon the longitudinal distil end of the head flange portion 14 there is a cap 10.

Once fitted the cap 10 closes off the upper longitudinal ends of the first and second recesses 22,20. The cap 10 is arranged to secure the strengthening band 8 and collar 12 within the recesses 22,20, and ensure that they are properly engaged therein. The cap, when fitted to the socket 4, thereby prevents the strengthening band 8 and collar 12 from moving longitudinally (vertically upwards as shown) from and out of the socket 4.

The cap 10 comprises a generally planar disc member with a central hole defined therein. The central hole within the cap 10 generally corresponds to the outer diameter of the post 2 such that the post 2 can be fitted through the central hole in the cap 10 and into the bore of the socket 4. The cap 10 is arranged to securely engage and be fitted to the head portion 14. In this embodiment a peripheral flange wall 25 depends from the periphery of the cap 10. Around the distal end of this peripheral flange 25 there is an inwardly direct lip projection 24. This flange and lip 24 are arranged to be engaged against a cooperating outward lip projection 26 on the outer surface of the head portion 14. During assembly the cap 10 is 'snap-fitted' onto the head portion 14. The cap 10 is pressed longitudinally onto the end of the flange head portion 14. The lip 24 on the peripheral flange 25 of the cap 10 rides over and longitudinally beyond the lip 26 on the outside of the head portion 14 with the peripheral flange 25 of the cap 10 flexing outwardly slightly to allow this. The engagement of the two cooperating lip projections 24,26 then secures the cap 10 onto the end of the head portion 14. To remove the cap 10, for example to remove the post 2, the flange 25 of the cap 10 has to be prised outwards, using for example a screwdriver or other suitable tool, to allow the lip 24 to be eased back over the lip 26 on the head portion 14.

It will be appreciated that other alternative arrangements could be used to secure the cap 10 to the head portion 14. In particular for example fastening screws which are engaged within the head portion 14 could be used instead of or in addition to the snap fit arrangement. The use of fastening screws would provide a more secure engagement of the

cap with the head portion although would add complexity to the arrangement. To prevent unauthorised removal the heads of the fastening screws could have a non standard shape such that a specific 'key' tool is required for the screws.

The dividing wall portion 21 of the head portion 14 between the first and second recesses 22,20, terminates short of the end of the longitudinal end of the head portion 14 and part way along the collar 12 and strengthening band 8. The cap 10 includes a further annular flange wall 28 projecting longitudinally from the cap 10. This flange wall 28, when the cap 10 is fitted to the head portion 14 fits, and is engaged, between the upper portion of the collar 12 and strengthening band 8 and continues the dividing wall portion 21 of the head portion 14. The fitting of the flange wall 28 between the collar 12 and strengthening band 8 when the cap 10 is fitted secures the upper portions of the strengthening band 8 and collar 12 radially in position within the socket assembly 4. This secures and further locks the strengthening band collar in position within the socket 4. In particular this also urges the collar 12 radially and increases the frictional engagement of the post 2 and collar 12 thereby increasing the grip on the post 2.

In use the socket 4 is seated at the bottom of a hole excavated in the ground 1 and concrete (or other filling material) is poured into the hole around the socket 4 and allowed to set to hold the socket 4 in place in the ground 1. The head portion 14 of the socket 4 is positioned substantially level with the ground level. The strengthening band 8 and collar 12 are then fitted into the respective recesses in the socket 4. Alternatively the strengthening band 8 and/or collar 12 may have already been fitted into the recesses 22,20 prior to installation of the socket 4 in the ground 1. The cap 10 is then fitted over the base of the post 2 with the post 2 passing though the cental hole in the cap 10. The base of the post 2 is then inserted into and through the collar 12 and into the bore of the socket 4. The profiling and directional engagement of the serrations 31a,31b,31c on the collar 12 mean that this insertion of the post 2 is relatively easy with the base of the post relatively easily passing through the collar 12. Furthermore since the upper portion of the collar 12 is not restrained by the dividing wall 21 the upper part of the collar 12 can deflect outwards such that is not urged into engagement with the post 2 so further allowing easy insertion of the post 2 though the collar 12. The post 2 is inserted into the socket 4 until the base of the post 2 is

engaged upon the stud 18 at the bottom end of the socket 4. With the post 2 installed within the socket 4 the cap 10 is then slid longitudinally down the post 2 and onto the end of the head portion 14 of the socket 4. The cap 10 is then pressed home and snap fitted onto the end of the head portion 14 of the socket 4. The cap 10 thereby secures and ensures that the strengthening band 8 and collar 12 are engaged within the recesses 20,22 and into the head portion 14 of the socket 4. The flange 28 of the cap 10, as the cap 10 is fitted, fits and is inserted between the upper part of the collar 12 and strengthening band 8. As the cap 10 is fitted this urges and presses the collar 12 inwards and further into engagement with the post 2. In this way the cap 10 secures and engages the collar 12 in place and within the socket 4 and thereby secures the post within the socket 4. The cap in effect when fitted, and by its engagement with the head portion 14 locks the strengthening band 8 and collar 12 in position within the socket 4 and the collar 12 into engagement with the post 2 to thereby secure the post 2 within the socket 4.

To remove the post 2, for example in the event of damage to the post 2 or street furniture which it mounts, the cap 10 is first prised way from and off the head portion 14 of the socket 4. The cap 10 can then be slid longitudinally upwards, away from and out of engagement with the socket 4. This releases the collar 12 from engagement within the head portion 14, opening the upper end of the recesses 20,22 and allowing the upper portion of the collar 12 to expand and/or move radially outwards. This unlocks the collar 12 (and also strengthening band 8) from engagement within the socket 4 and partially from engagement with the post 2. The post 2 is thereby at least partially released from the socket 4 and can be withdrawn from the socket 4. As the post 2 is withdrawn the post 2 either slides out from the collar 12 and/or the collar 12 slides out of the recess 22 in the socket 4 along with the post 2. In the later situation the collar can then separately be removed (if necessary by cutting) from the post 2.

Subsequently the original post 2, or a replacement post 2, may be reinstalled and inserted into the original socket 4 in a similar manner to that described above. If necessary a new collar 12 can be used and fitted into the socket 4. In this way the mounting posts are securely fixed into the ground 1 whilst they can be removed and replaced simply and easily without necessitating extensive digging and breaking up of the ground.

It will also be appreciated that with this arrangement the post 2 can be more securely locked in place by engagement of the separate cap 10 with the socket 4. In particular tighter gripping collars can be used without adversely preventing authorised disassembly and removal of the post. Consequently removal of the post 2 by vandals casually pulling on the post 2 is substantially prevented, whilst the post 2 can be easily removed by suitably equipped personnel first removing the cap 10 to release the post 2 and collar 12 from the socket 4.

The use of a removable separate cap to secure and lock the collar 12 into the socket 4, also allows the use of a directionally engaged and gripping collar 12 which more securely and tightly grips the post 2 from removal than against insertion of the post. The use of such a directional gripping collar 12 is problematic with conventional arrangements since it make authorised removal similarly difficult.

Additionally by using a separate cap 10 which locks and urges the collar into further engagement with the post also further improves the gripping of the post whilst again not adversely affecting authorised removal of the post.

A further advantage of this arrangement is that the collar, strengthening band, and cap can all be individually replaced in the event of damage. If for example the post or street furniture which it mounts is hit be a vehicle a high impact load is applied to the head portion 14 of the socket 4 with the post 2 typically pivoting about the head 14 of the socket 2 about which the post 2 is mounted into the ground. In particular this impact load is most likely to cause the strengthening band 8, which reinforces the head portion 14 to fracture. With previous arrangement the fracture or damage of the strengthening band or reinforcement embedded within the socket 4 would necessitate digging up of the ground and removal and of the entire socket 4. In contrast with this arrangement the main socket 4 can be left in place and the strengthening band simply replaced within the recess 20. Similarly if the cap 10 or collar is damaged they can also be individually and easily replaced.

A yet further advantage of this arrangement is that it is considerably easier to fabricate than the prior arrangements. The socket 4 and cap is preferably made from injection moulded plastic. The strengthening band 8 and collar 12 are then installed as separate items within the finished moulded socket. It will be appreciated that the moulding of the socket without an embedded strengthening band 8 is considerably more straightforward than, as with the prior arrangements having to mould the socket with an embedded band 8. Separate materials, optimised for the individual parts can also more readily be used since the various parts (socket body, strengthening band 8, collar 12 and cap 10) are separate and discrete parts. For example in the described embodiment the main tubular body 6 and main part of the socket are made from injection moulded polypropylene. This is easy to injection mould. The strengthening band 8 is made from 40% glass (either glass fibre or glass) reinforced compression moulded nylon to provide good strength. The collar is made from a EPDM, a synthetic rubber, to provide high frictional engagement and also a degree of resilience to securely grip the post. It will be appreciated though that other suitable materials and comminations of materials could be used in other embodiments

Referring now to figure 3, the tubes used in a typical application are manufactured to generous tolerances and to provide a means for accommodating these variations the bore of the tubular main body portion 6 has been provided with a number (dependant on tube cross sectional shape of the tube) of longitudinal ridges 33, reference figure 3 (which is a cross sectional view of the tubular main body 6 suitable to receive a square section tube). The peaks of the ridges 33 represent the minimum size of the tube and if a slightly larger tube is fitted, then as it is forced into the tubular main body 6 it shaves the required amount off the peak of the ridges 33 to create a hole of dimensions that correspond to that particular tube. In variations of the pole housing that require higher levels of shock absorbency, this feature may be omitted.

In the original design, when the pole 2 is subjected to an impact the collar 12, which is made of a compliant material, is deformed to some degree and as this occurs energy is absorbed. The absorption of energy reduces the peak load applied to the pole by the impact and will either reduce the damage to the pole or could prevent structural failure of the pole.

To provide a degree of shock absorption it is necessary to allow the component being subjected to an impact to move a distance whilst simultaneously providing a resistance to the impact. This is based on the theory that work done is equal to force multiplied by distance travelled. In the case of the pole housing, the pole, when subjected to an impact, should be allowed to move whilst generating a force resisting that movement. Ideally, the optimum force produced should be only slightly less that the force necessary to cause failure of the pole.

Referring now to figures 4-6, the head portion 14 essentially remains as previously described with the exception that the pole 2 is allowed to move more within the collar 12 to increase the amount of shock absorption. In the base of the main tubular body 6 a compliant bush 34 is housed and retained in position by a cap 36 which is a snap fit into the base of the main tubular body 6. The pole 2 is a slide fit into the compliant bush 6 which firmly locates pole 2. In the event of an impact to the pole 2, the bush 6 and collar 12 permit the pole to move whilst providing a considerable resistance to the movement and hence absorbing the impact load. The compliant bush 34 can have the force it produces to resist the impact load modified by varying the properties of the compliant material, such as hardness, and by changing the cross sectional profile. Figures 5 and 6 show compliant bush 34 with grooves 37 around the periphery. These have the effect of reducing the resistance to the impact. Different applications will employ tubes of different strengths and it is important to be able to adjust the properties of both the collar 12 and compliant bush 34 to achieve maximum shock absorption.

Whilst the above arrangement has been described with reference to a single post mounting, it will be appreciated that the same principles can be applied to a single double socket arrangement in which two posts can be mounted within the same socket assembly. In such a case the socket assembly would comprise two internal bore sections and two collars (possibly joined into a single element). Similarly a single multiple post socket could also be produced.

CLAIMS

2. A post mounting arrangement for ground installation of a post comprising a tubular body portion which is adapted to be installed into the ground and has an open end adapted to receive a post to be supported, the open end of the tubular body portion comprising an enlarged flange portion defining a head portion of the tubular main body portion, the head flange portion includes a resilient retaining collar adapted to receive and engage the post, and a strengthening band;

wherein the head portion comprises a first recess defined therein within which the said collar is engaged and mounted, a second recess defined in the head portion outwardly of said first recess and adapted to receive the said strengthening band, and a cap which is adapted to be fitted to and engages with said head portion to enclose said recesses and secure said collar and strengthening ring within said recesses.

3. A post mounting arrangement as claimed in claim 1 in which the post and tubular main body portion are of a generally circular cross section.

4. A post mounting arrangement as claimed in claim 1 in which the post and tubular main body portion are of a generally square or rectangular cross section.

5. A post mounting arrangement as claimed in an preceding claim in which the cap when engaged and fitted to the head portion is adapted to urge the collar inwards, in use, into engagement with the post.

6. A post mounting arrangement as claimed in an preceding claim in which said first recess defined in said head portion is adapted such that said collar can flex away from, in use, engagement with said post.

7. A post mounting arrangement as claimed in an preceding claim 5 in which said cap includes a portion which is adapted, when said cap is fitted to said head portion, cooperates with said first recess to urge said collar, in use into engagement with

said post.

8. A post mounting arrangement as claimed in claim 6 in which said cap includes a flange projection which cooperates with said first recess and head portion to when the cap is fitted and in use urge the collar into engagement with said post.

9. A post mounting arrangement as claimed in any preceding claim in which the collar 12 comprises a post abutment surface which is adapted to provide, in use, an enhanced interference fit and grip on the said post against movement in a first direction as compared to movement in a second direction.

10. A post mounting arrangement as claimed in claim 8 in which said post abutment surface of said collar comprises at least one serration or ridge.

11. A post mounting arrangement as claimed in claim 9 in which said at least one serrations is directionally orientated such that a first surface of said serration abuts said post and a different angle to a second surface of said serration.

12. A post mounting arrangement as claimed in an preceding claim in which the collar is fabricated from a resilient material.

13. A post mounting arrangement as claimed in claim 11 in which said collar is fabricated from a rubber material.

14. A post mounting arrangement as claimed in an preceding claim in which said tubular body portion is fabricated from an injection moulded plastic material.

15. A post mounting arrangement as claimed in claim 13 in which said plastic material comprises polypropylene.

16. A post mounting arrangement as claimed in an preceding claim in which said cap is adapted to be snap fitted to said head portion.

17. A post mounting arrangement as claimed in claim 15 in which said cap includes a flange lip which is cooperatively engaged with a cooperating flange lip on said head portion.

18. A post mounting arrangement as hereinbefore described with reference to figures 1 and 2.

19. Method of erecting a post using a post mounting arrangement as claimed in any preceding claim comprising the steps of:

a) installing said tubular main body in the ground,

b) installing said strengthening band in said second recess,

c) installing said collar in said first recess,

d) inserting a base end of said post through said collar and into said tubular body portion,

e) fitting said cap to said head portion to secure said collar within said head portion.

20. Method of erecting a post as claimed in claim 18 in which said post is inserted through said collar prior to installing said collar and inserting said post into said main tubular body.

21. A method of erecting a post as hereinbefore described with reference to figures 1 and 2.

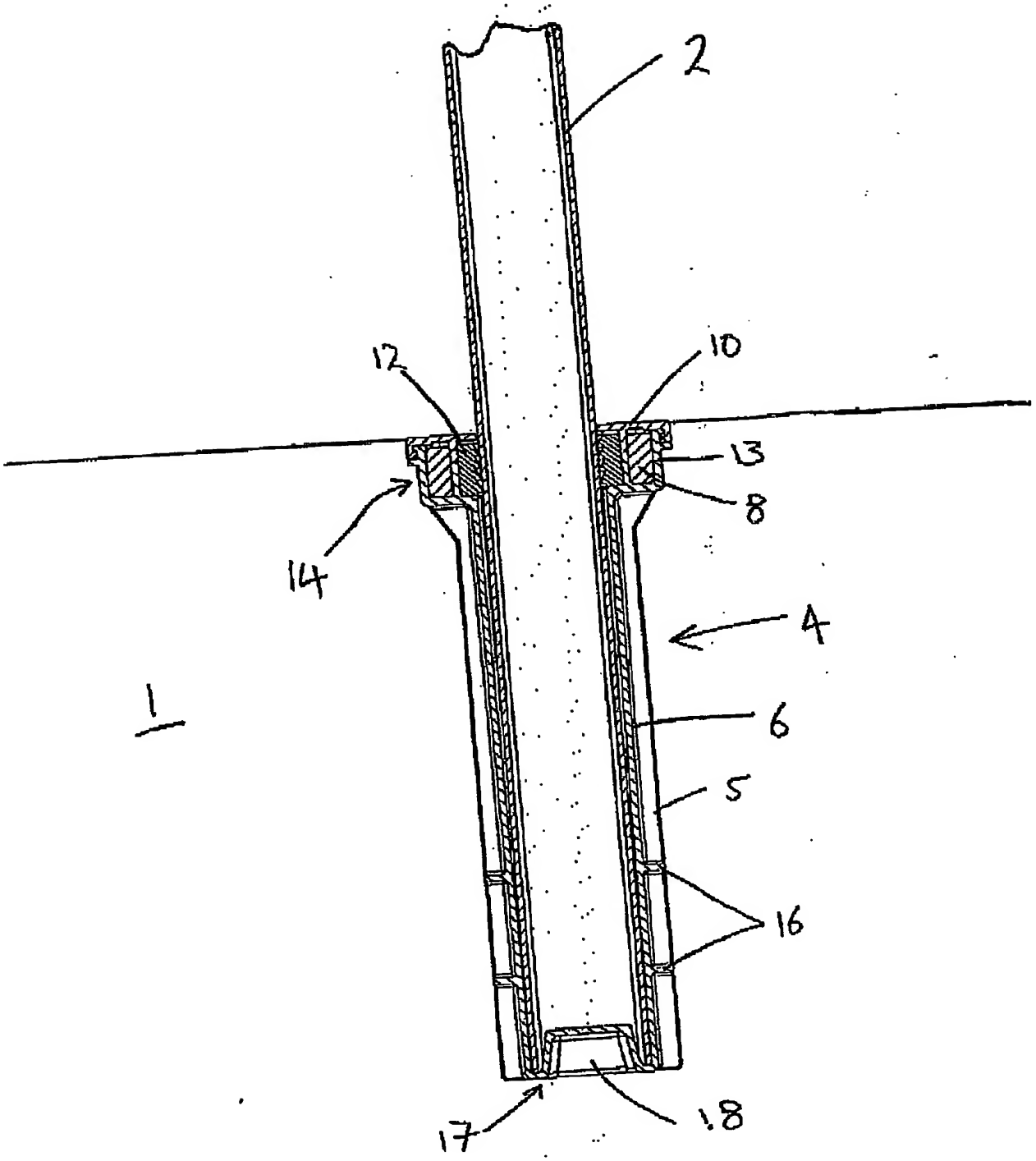

FIG 1

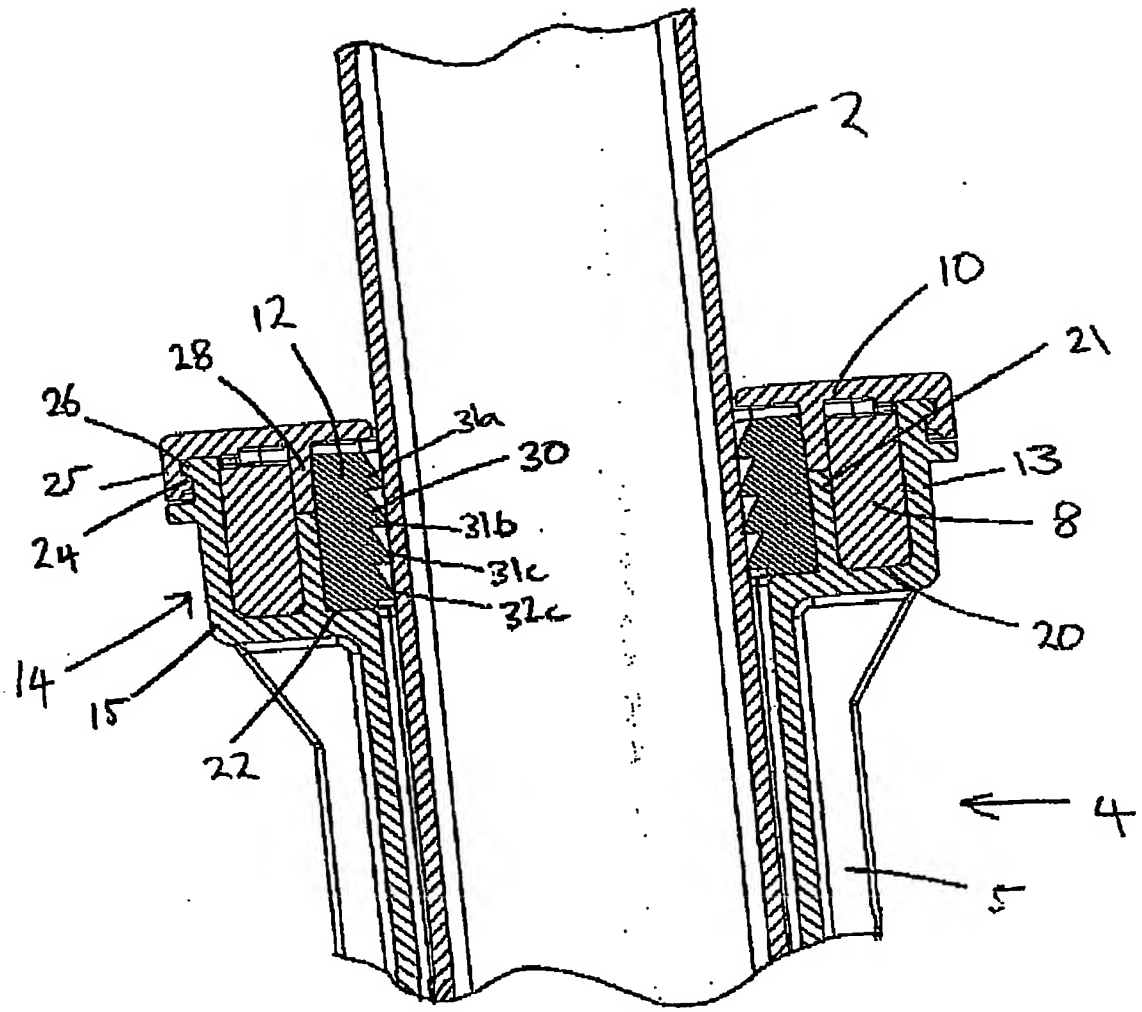

FIG 2

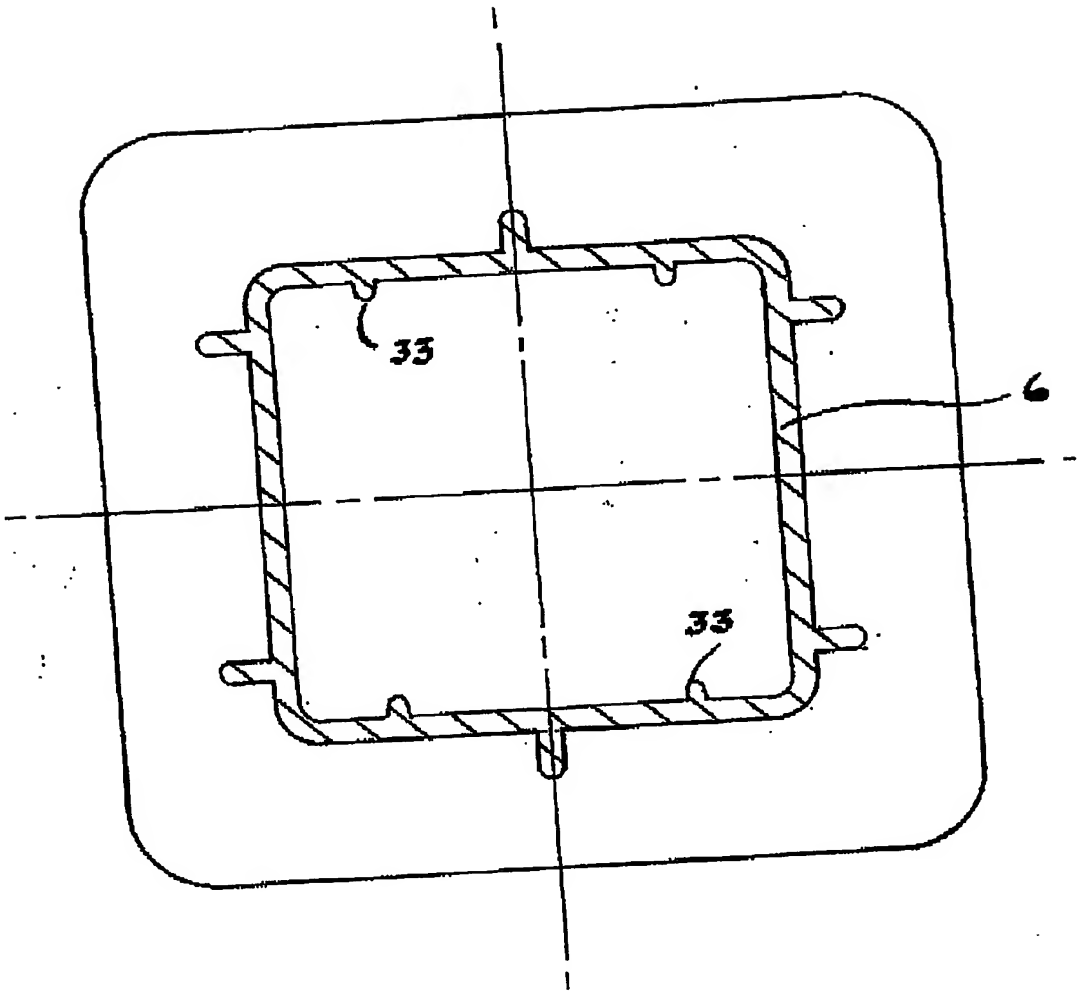

FIG 3

415

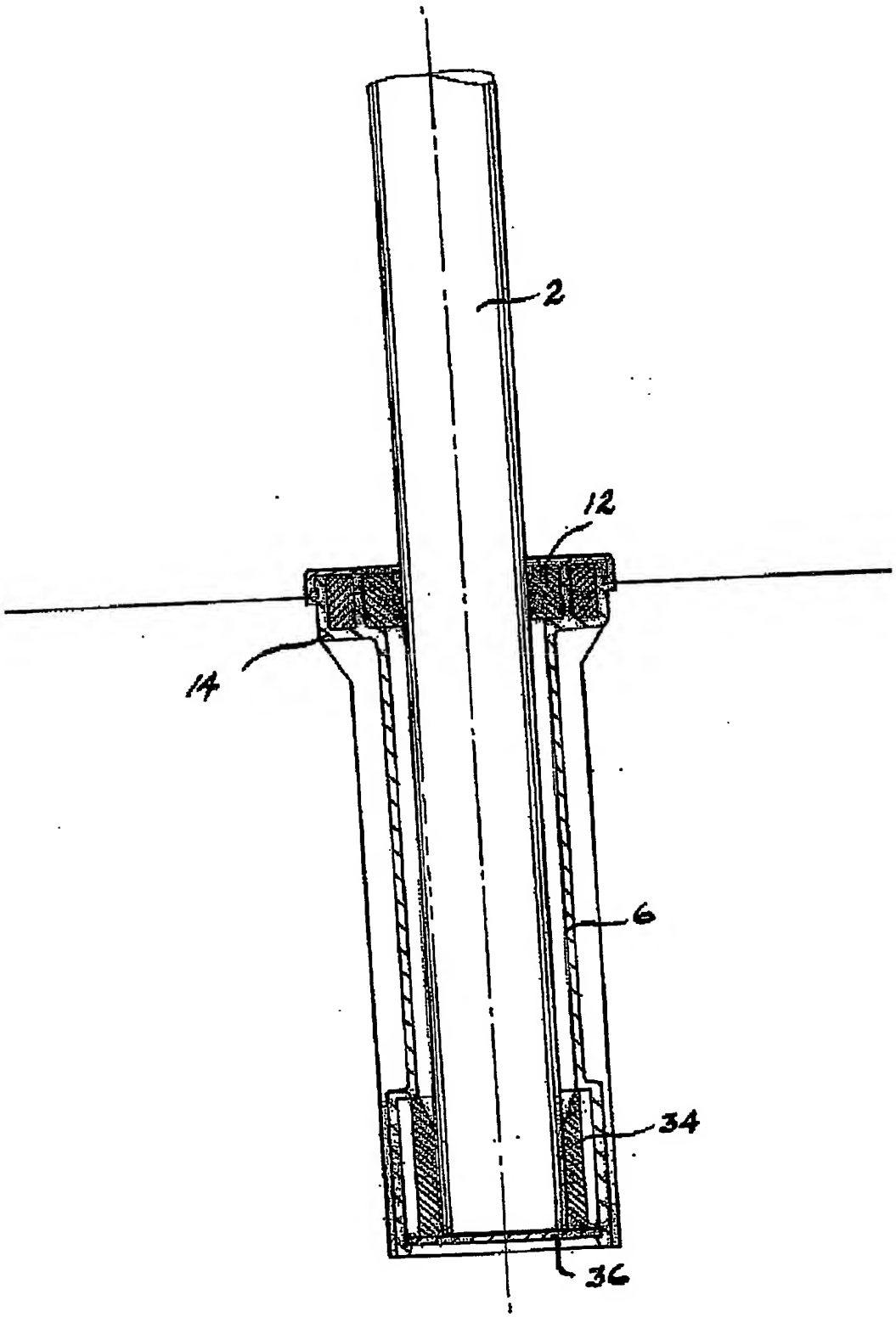

FIG 4.

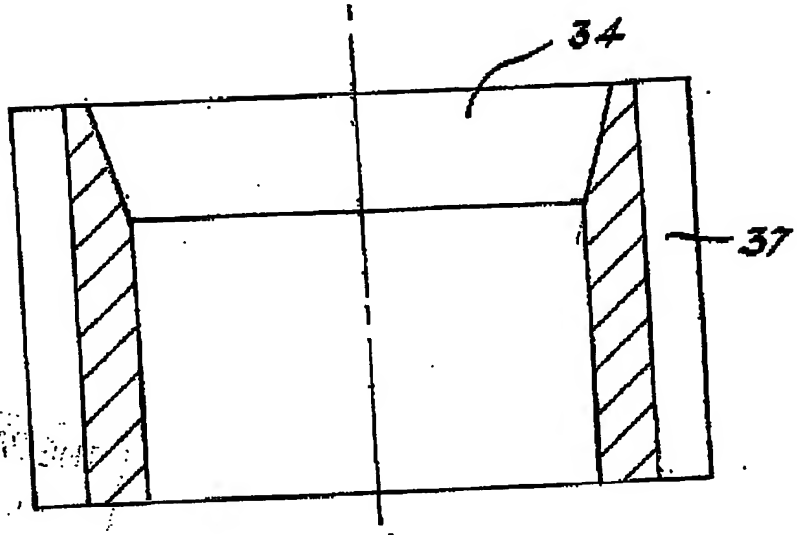

FIG 6 SECTION ON XX

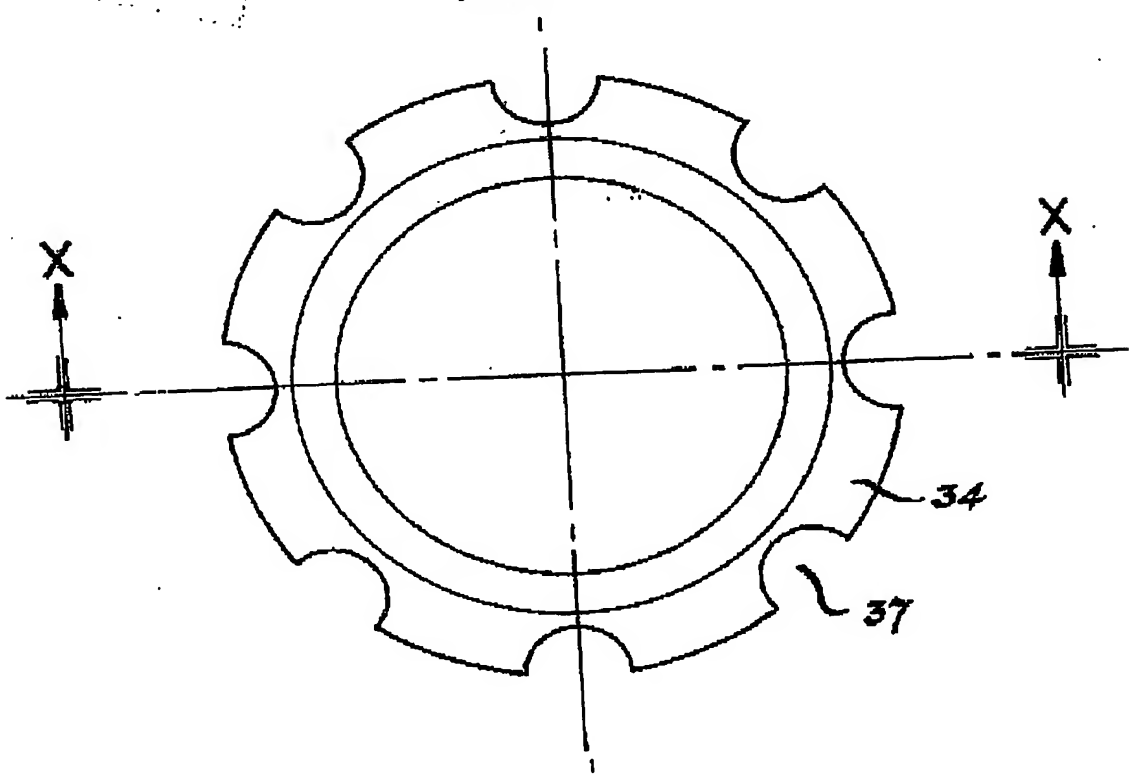

FIG 5.